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(54) **LED MODULES WITH BALL JOINT
ADJUSTABLE SUPPORT**

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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

1,615,067 A * 1/1927 Boerman **F21V 21/29**
174/21 JC
5,722,762 A * 3/1998 Soll **F21L 15/14**
362/105
7,011,431 B2 * 3/2006 Ono **F21S 4/20**
362/241

(Continued)

FOREIGN PATENT DOCUMENTS

DE 202008005814 U1 9/2008
DE 102007029080 A1 12/2008

(Continued)

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(57) **ABSTRACT**

A modular assembly for a headlight includes at least one semiconductor light module having at least one semiconductor light source mounted on a cooling element, having at least one ball socket in which the semiconductor light module is mounted and configured to be pivoted about a ball socket center, a curved cup formed in the cooling element and configured to be mounted in the ball socket, and a guide shell arranged between the curved cup and the ball socket. A method for adjusting the semiconductor light module is also disclosed.

8 Claims, 2 Drawing Sheets

